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Vasudevan

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(54) **DOOR LOCK ASSEMBLY**

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E05B 55/00 (2006.01)

(52) **U.S. Cl.**
CPC ***E05B 55/005*** (2013.01); *Y10T 70/5531* (2015.04); *Y10T 292/0997* (2013.01); *Y10T 292/1016* (2015.04); *Y10T 292/1022* (2015.04)

(58) **Field of Classification Search**
CPC E05B 55/005; E05B 15/0053; Y10T 292/0997; Y10T 292/1016; Y10T 292/1022; Y10T 70/5531
USPC ..... 292/347, 137, 163, 169, 348, DIG. 37; 70/221–224, 468, 472, 481
See application file for complete search history.

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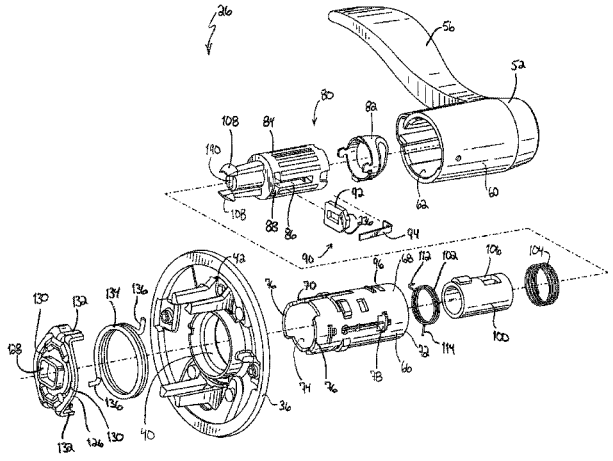
(57) **ABSTRACT**

A lock assembly that includes an interior locking actuator, a biasing member that biases the interior locking actuator toward an unlocked position, a retaining member that retains the interior locking actuator in a locked position, and a driver rotatable from a locked position to an unlocked. The interior locking actuator is manually pushed and manually rotated to move the interior locking actuator from the unlocked position to the locked position. When the interior locking actuator is in the locked position, movement of the interior handle to retract a latch causes the biasing member to move the interior locking actuator toward the unlocked position.

19 Claims, 7 Drawing Sheets



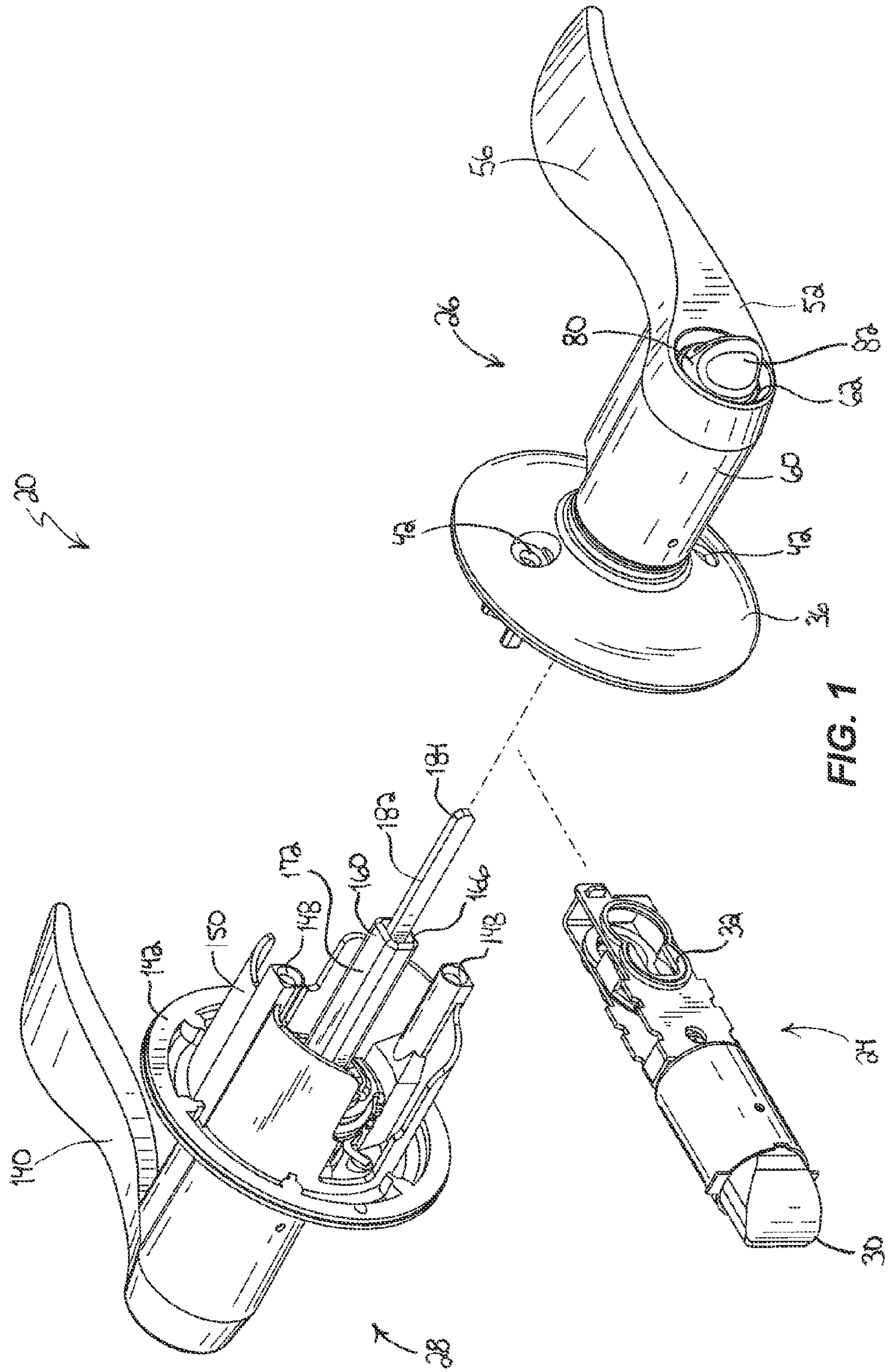

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FIG. 1

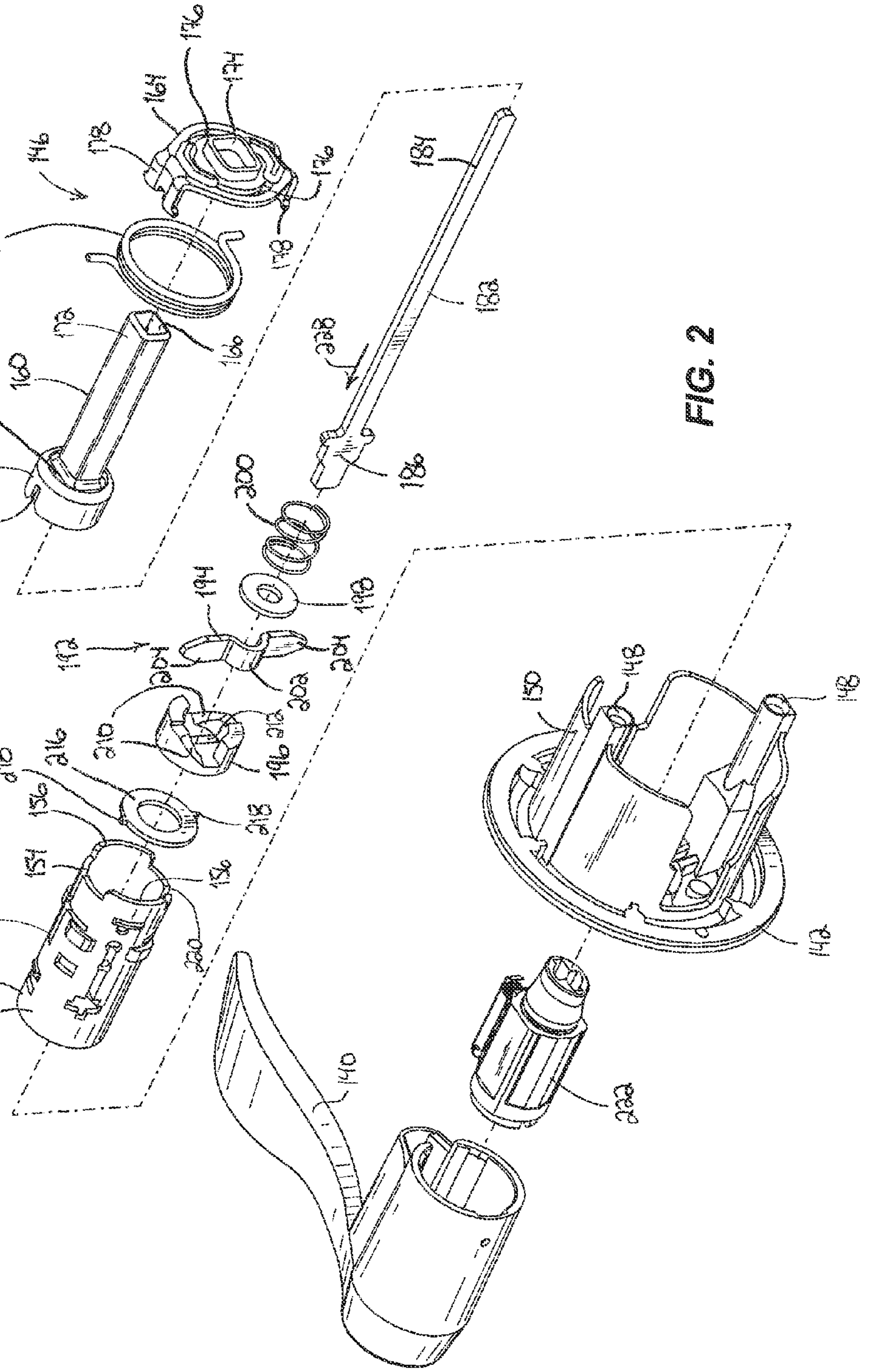

FIG. 2

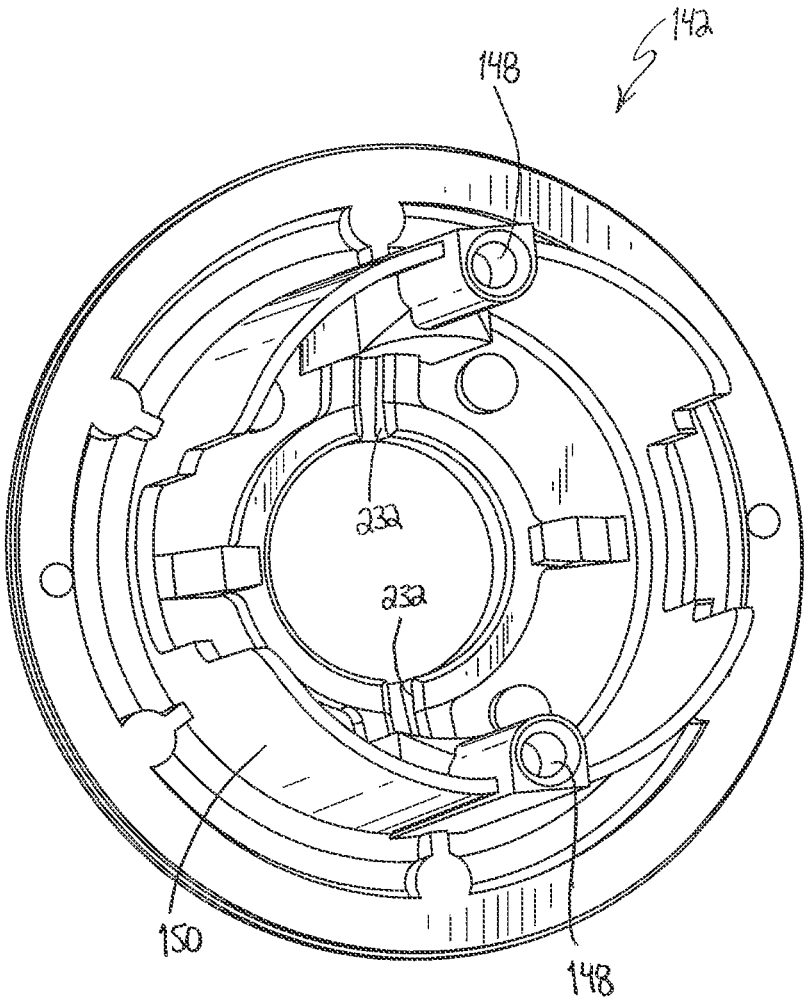

FIG. 3

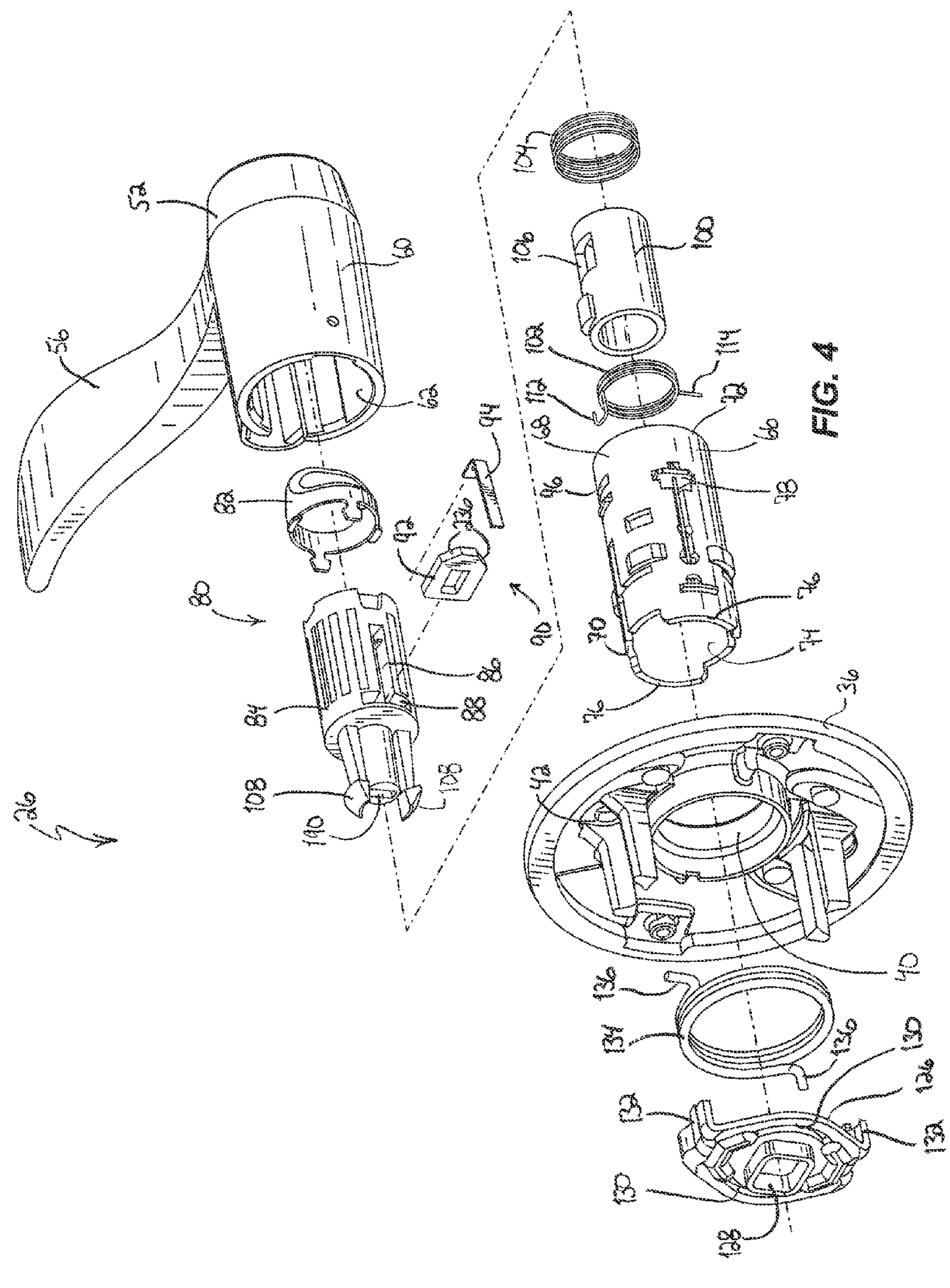

FIG. 4

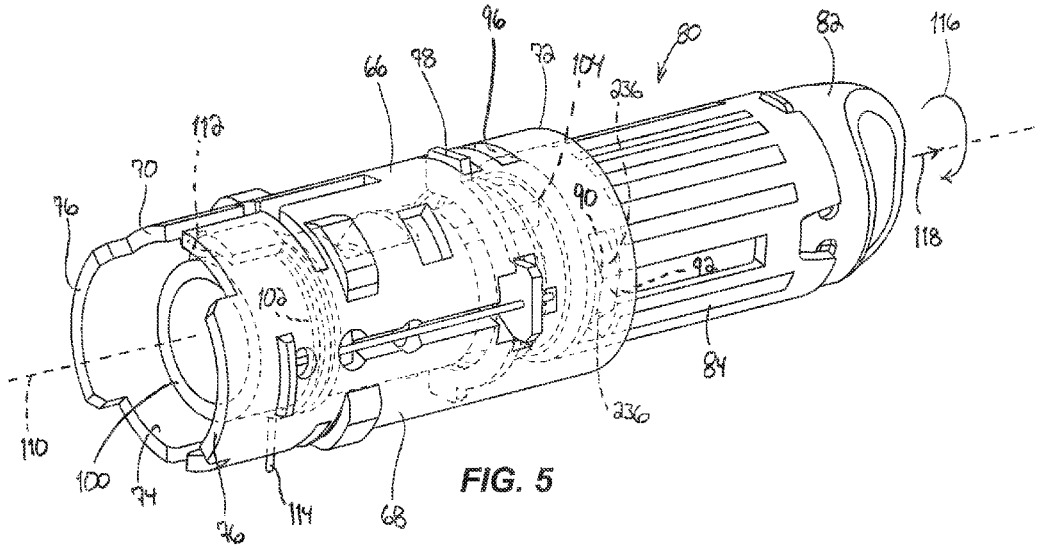
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FIG. 5

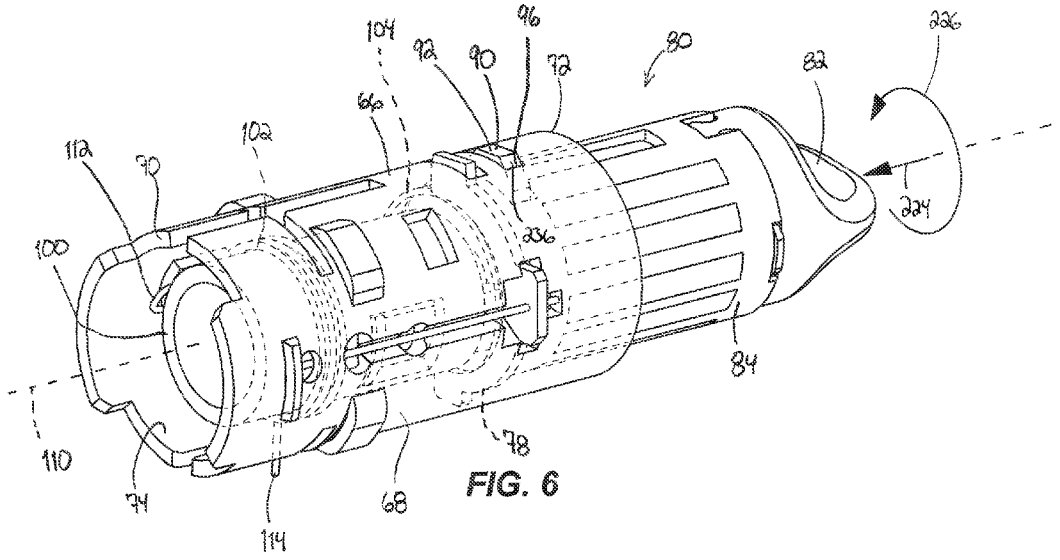
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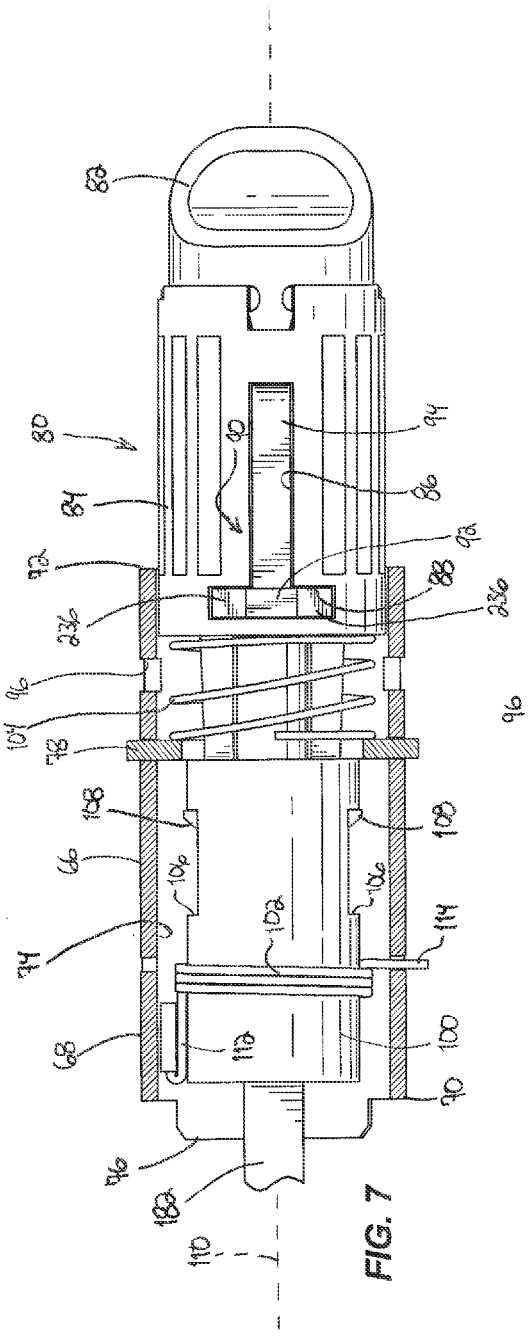
FIG. 6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188
110

FIG. 7

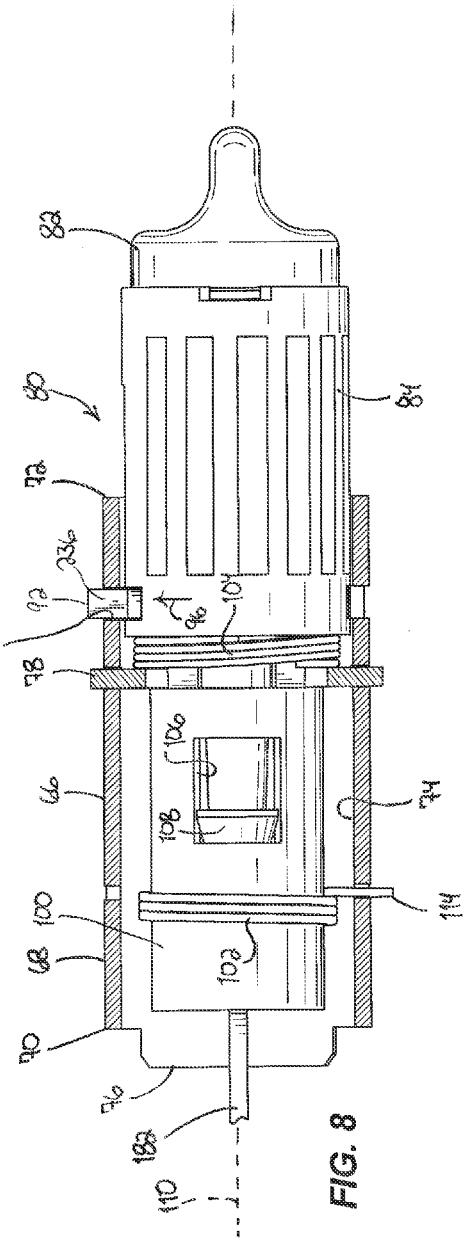
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FIG. 8

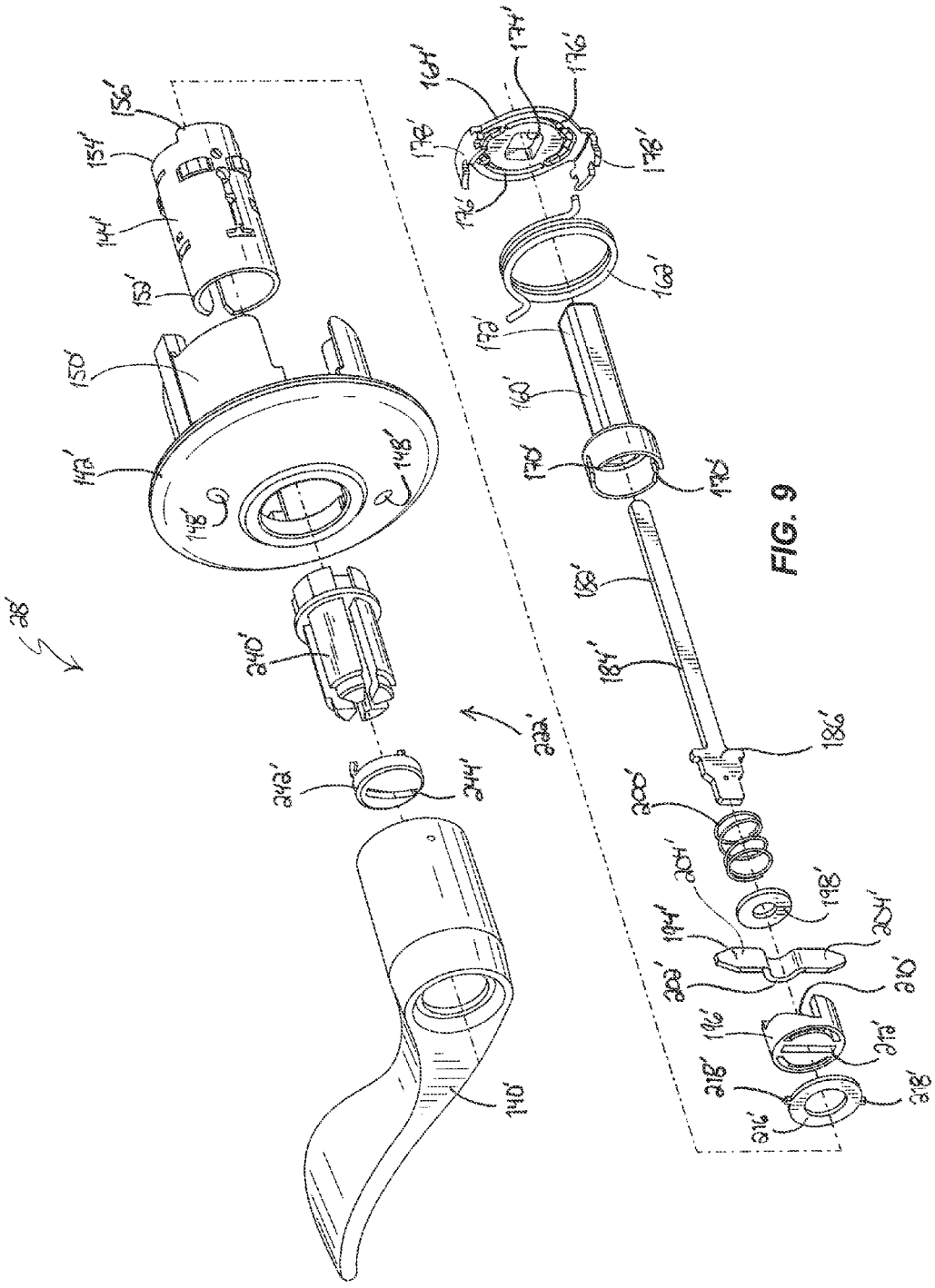
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FIG. 9

DOOR LOCK ASSEMBLY

BACKGROUND

The present invention relates to locks, and more particularly to tubular locks for doors.

Door locks typically include an interior assembly, an exterior assembly, and a latch assembly. When the door is closed the latch assembly engages a pocket or recess formed in a frame of the door to hold the door in the closed position. Generally, in tubular lock assemblies the interior and exterior assemblies both include a handle that is rotatable to retract the latch so that the door can be opened. Often, the interior assembly further includes a locking actuator having a push button or a turn button that is manually operable to lock the lock assembly. When the lock assembly is locked, the exterior handle is inoperable to retract the latch and the door cannot be opened using the exterior handle.

SUMMARY

In one embodiment, the invention provides a lock assembly for use with a latch movable from an extended position to a retracted position. The lock assembly includes an interior handle manually operable to move the latch from the extended position to the retracted position, an interior locking actuator manually movable from an unlocked position to a locked position, a biasing member that biases the interior locking actuator toward the unlocked position, a retaining member that retains the interior locking actuator in the locked position against the bias of the biasing member, an exterior handle, and a driver rotatable from a locked position to an unlocked position such that the exterior handle is manually operable to retract the latch when the driver is in the unlocked position and the exterior handle is inoperable to retract the latch when the driver is in the locked position. The interior locking actuator is manually pushed and manually rotated to move the interior locking actuator from the unlocked position to the locked position. When the interior locking actuator is in the locked position, movement of the interior handle to retract the latch causes the biasing member to move the interior locking actuator toward the unlocked position.

In another embodiment the invention provides a lock assembly for use with a latch movable from an extended position to a retracted position. The lock assembly includes a driver rotatable from a locked position to an unlocked position, an exterior handle manually operable to move the latch from the extended position to the retracted position when the driver is in the unlocked position and inoperable to move the latch when the driver is in the locked position, and an exterior locking actuator coupled to the driver. The exterior locking actuator is operable to rotate the driver from the locked position toward the unlocked position. The lock assembly further includes an interior handle manually operable to move the latch from the extended position to the retracted position, an interior locking actuator coupled for rotation with the driver and the interior locking actuator is manually movable from an unlocked position to a locked position and operable to rotate the driver from the unlocked position to the locked position. The lock assembly further includes a first biasing member that biases the interior locking actuator in a direction from the exterior handle toward the interior handle, a second biasing member that rotationally biases the interior locking actuator with respect to the interior handle toward the unlocked position, and a retaining member that retains the interior locking actuator in the locked position against the bias of the first biasing member and the bias of the second biasing member.

Rotation of the driver from the locked position to the unlocked position by the exterior locking actuator disengages the retaining member such that the first biasing member moves the interior locking actuator in the direction from the exterior handle toward the interior handle and the second biasing member rotates the interior locking actuator to push and rotate the interior locking actuator from the locked position to the unlocked position.

Other aspects of the invention will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a partially exploded view of a lock assembly according to one embodiment of the invention.

FIG. **2** is an exploded view of an exterior assembly of the lock assembly of FIG. **1**.

FIG. **3** is a perspective view of a chassis of the exterior assembly of FIG. **2**.

FIG. **4** is an exploded view of an interior assembly of the lock assembly of FIG. **1**.

FIG. **5** is a perspective view of a portion of the interior assembly of FIG. **4** in an unlocked position.

FIG. **6** is a perspective view of the portion of the lock assembly of FIG. **5** in a locked position.

FIG. **7** is a partial cross-sectional side view of a portion of the lock assembly of FIG. **1** in an unlocked position.

FIG. **8** is a partial cross-sectional side view of the portion of the lock assembly of FIG. **7** in a locked position.

FIG. **9** is an exploded view of an exterior assembly of a lock assembly according to another embodiment of the invention.

DETAILED DESCRIPTION

Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways.

FIG. **1** illustrates a lock assembly **20**. The illustrated lock assembly **20** is a tubular lock assembly for use with a door (not illustrated). The lock assembly **20** includes a latch assembly **24**, an interior assembly **26**, and an exterior assembly **28**. The exterior assembly **28** is coupled to and extends from an exterior surface of the door and the interior assembly **26** is coupled to and extends from an interior surface of the door. The latch assembly **24** includes a latch **30** movable from an extended position to a retracted position using the interior and exterior assemblies **26** and **28**. A latch actuator **32** of the latch assembly **24** is rotatable to retract the latch **30**. The latch assembly **24** is located between the exterior assembly **28** and the interior assembly **26** in a bore of the door such that the latch **30** engages a pocket, often defined by a strike plate, in a frame of the door to hold the door in the closed position.

Referring to FIGS. **1** and **4**, the interior assembly **26** includes an interior chassis **36**. The interior chassis **36** couples to the door such that the interior chassis **36** is generally fixed with respect to the door. The interior chassis **36** includes a handle receiving aperture **40** that extends through the interior chassis **36**. Fastener receiving apertures **42** also extend through the interior chassis **36**. A fastener (not shown) extends through each of the fastener receiving apertures **42** to couple the interior chassis **36** to the door and to the exterior assembly **28** (FIG. **1**).

With continued reference to FIGS. **1** and **4**, an interior handle **52** is coupled to the interior chassis **36** for rotation with respect to the interior chassis **36**. The interior handle **52** includes an interior handle portion **56** and a locking actuator receiving portion **60**. The locking actuator receiving portion **60** defines an aperture **62**. The handle portion **56** is configured to be grasped by a user of the lock assembly **20** to manually rotate the interior handle **52** to retract the latch **30**. The illustrated interior handle **52** is just one possible construction of the interior handle, and in other constructions the interior handle can take other suitable forms, such as round knobs and the like.

Referring to FIG. **4**, a hollow interior spindle **66** is partially received within the locking member receiving aperture **62** of the interior handle **52**. The interior spindle **66** includes a generally cylindrical outer wall portion **68** that defines an interior end portion **70**, an exterior end portion **72**, and an aperture **74** that extends longitudinally through the center of the outer wall portion **68** from the interior end portion **70** to the exterior end portion **72**. The outer wall portion **68** further includes retraction member engaging projections **76** that extend from the interior end portion **70**. When the interior assembly **26** is assembled, the spindle **66** is received in the aperture **62** of the interior handle **52** and the spindle **66** is coupled for co-rotation with the interior handle **52** relative to the chassis **36** via a clip **78**.

The interior assembly **26** further includes an interior locking actuator **80** that is manually pushed and rotated by a user from an unlocked position to a locked position. The interior locking actuator **80** includes a button **82** that extends from the interior handle **52** when the interior assembly **26** is assembled (see FIG. **1**) and the button **82** is partially disposed within the locking actuator receiving aperture **62** of the interior handle **52**.

With continued reference to FIG. **4**, the locking actuator **80** further includes a body portion **84** coupled to and substantially fixed with respect to the button **82**. The body portion **84** is received within the longitudinal aperture **74** of the interior spindle **66** such that the body portion **84** is movable with respect to the interior spindle **66**. The body portion **84** defines a cavity **86** and a retaining member slot **88** connected to the cavity **86**.

A retaining member **90** is disposed within the cavity **86**. The illustrated retaining member **90** includes a tab **92** and a biasing member **94**, which is a leaf spring in the illustrated embodiment. The tab **92** extends through the retaining member slot **88** of the body portion **84**. As illustrated in FIGS. **7** and **8**, and as will be discussed in more detail below, a portion of the tab **92** is selectively extendable through a retaining member receiving aperture **96** of the interior spindle **66** to retain the interior actuator **80** in the locked position (FIG. **8**). The spring **94** biases the tab **92** outward through the retaining member slot **88** (in the direction of arrow **96** in FIG. **8**) to releasably retain the interior actuator **80** in the locked position.

Referring to FIG. **4**, the interior locking actuator **80** further includes a biasing member support **100**, a first biasing member **102**, and a second biasing member **104**. Referring to FIGS. **7** and **8**, the support **100** is generally cylindrical and is received in the aperture **74** of the spindle **66**. The support **100** includes elongated apertures **106** that receive tabs **108** of the actuator body **84** to couple the support **100** and the body **84**. The tabs **108** and the apertures **106** are sized so that the body **84** can slide with respect to the support **100** along an axis **110** but yet the body **84** and the support **100** are coupled for co-rotation about the axis **110** relative to the chassis **36** and the handle **52**.

The first biasing member **102**, which is a torsion spring in the illustrated embodiment, includes a first end **112** connected to the support **100** and a second end **114** connected to the spindle **66**. The torsion spring **102** rotationally biases the body **84** and the support **100** about the axis **110** in the direction of arrow **116** of FIG. **5**. The second biasing member **104**, which is a coil spring in the illustrated embodiment, is located between the body **84** and the clip **78**, and the spring **104** biases the body portion **84** along the axis **110** in the direction of arrow **118** in FIG. **7**.

Referring to FIG. **4**, the interior assembly **26** further includes a latch retractor **126**. The latch retractor **126** includes a centrally located square aperture **128** and arcuate apertures **130** that partially surround the square aperture **128**. The arcuate apertures **130** each receive a respective retraction member engaging projection **76** of the interior spindle **66** to couple the latch retractor **126** and the interior spindle **66** for co-rotation. The latch retractor **126** further includes tabs **132**. A torsion spring **134** having ends **136** is coupled to the latch retractor **126** so that each end **136** of the spring **134** contacts one of the tabs **132** of the latch refractor to rotationally bias the latch retractor **126** and the interior handle **52** relative to the interior chassis **36**.

Referring to FIG. **2**, the exterior assembly **28** includes an exterior handle **140**, an exterior chassis **142**, an exterior spindle **144**, and an exterior latch refractor assembly **146**. The exterior chassis **142** includes mounting apertures **148** that receive fasteners to couple the exterior assembly **28** to the door and to the interior assembly **26** (FIG. **1**). The exterior chassis **142** further includes a cylindrical portion **150** that is received in a bore of the door to couple the chassis **142** to the door.

The exterior spindle **144** is substantially cylindrical and hollow and includes a first or outer end portion **152** and a second or inner end portion **154**. While not visible in FIG. **2**, the chassis **142** includes a central aperture through which the outer end portion **152** of the spindle **144** extends when the exterior assembly **28** is assembled. The exterior handle **140** is coupled to the exterior spindle **144** adjacent the outer end portion **152** of the exterior spindle **144** such that the exterior handle **140** and the exterior spindle **144** are coupled for rotation together with respect to the exterior chassis **142**. The inner end portion **154** of the spindle **144** includes arcuate projections **156** that extend from the inner end portion **154** of the exterior spindle **144**.

The exterior latch retractor assembly **146** includes a latch actuator or tube **160**, an exterior handle biasing member **162**, and a latch retractor **164**. The tube **160** defines a tube aperture **166** and an enlarged hollow end portion **168** having a slot **170**. An inner end portion **172** of the tube **160** has a non-circular and substantially square cross-section. While only one slot **170** is visible in FIG. **2**, the tube **160** includes a second slot directly across from the visible slot **170** in the enlarged end portion **168** of the tube **160**.

The latch retractor **164** includes a tube receiving aperture **174**, spindle receiving apertures **176**, and tabs **178**. The tube receiving aperture **174** has a shape that is complimentary to the inner end portion **172** of the tube **160** and is sized such that the inner end portion **172** of the tube **160** can extend through the tube receiving aperture **174**, and yet rotation of the latch retractor **164** will rotate the tube **160**. The spindle receiving apertures **176** are arcuate apertures that partially surround the tube receiving aperture **174**. The spindle receiving aperture **176** are complimentary to the arcuate projections **156** of the inner end portion **154** of the spindle **144**. The arcuate apertures **176** of the latch retractor **164** each receive one of the arcuate projections **156** of the spindle **144** such that rotation

of the spindle **144** via the handle **140** produces a corresponding rotation of the latch retractor **164**. Rotation of the latch retractor **164** rotates the tube **160** and rotation of the tube **160** rotates the latch actuator **32** to retract the latch **30** (FIG. **1**). The exterior handle biasing member **162**, which is a torsion spring in the illustrated construction, is directly coupled to the chassis **142** and to the exterior latch refractor **164** using the tabs **178** of the latch retractor **164**. The exterior handle spring **162** rotationally biases the exterior handle **140** into the position illustrated in FIG. **1**.

Referring to FIG. **2**, the exterior assembly **28** further includes a driver **182**. The driver **182** includes an elongated portion **184** and an enlarged end portion **186**. When the exterior assembly **28** is assembled, the elongated portion **184** of the driver **182** extends through the aperture **166** of the tube **160**, and the driver **182** is free to rotate with respect to the tube **160**. The end portion **184** of the driver **182** extends into an aperture **190** (FIG. **4**) of the body **84** of the interior locking actuator **80** to couple the interior locking actuator **80** and the driver **182** for co-rotation relative to the interior chassis **36** and the exterior chassis **142**.

With continued reference to FIG. **2**, the exterior assembly **28** further includes an exterior handle locking assembly **192**. The exterior handle locking assembly **192** includes an exterior handle locking member **194**, a cam member **196**, a washer **198**, and a biasing member or spring **200**. The exterior handle locking member **194** defines a half cylinder portion **202** and includes projections or ears **204**. When the exterior assembly **28** is assembled, the half cylinder portion **202** of the exterior handle locking member **194** partially surrounds the driver **182**. The exterior handle locking member **194** is able to translate with respect to the driver **182** while the driver **182** generally does not rotate the exterior handle locking member **194** (i.e., the driver **70** rotates with respect to the exterior handle locking member **194**).

Referring to FIG. **2**, the cam **196** includes cam ramps **210** that correspond to the ears **204** of the exterior handle locking member **194**. Thus, when the exterior assembly **28** is assembled, each ear **204** will travel along a respective ramp **210** of the cam member **196**. The cam member **196** further includes a cam member aperture **212**. The cam member aperture **212** is generally rectangular in shape and complements the cross-sectional shape of the elongated portion **184** of the driver **182**. Therefore, the cam member aperture **212** couples the cam member **196** to the driver **182** such that the cam member **196** rotates with the driver **182**.

The spring **200** of the exterior handle locking assembly **192** is a coil spring in the illustrated embodiment. When the exterior assembly **28** is assembled, the spring **200** is partially received in the enlarged end portion **168** of the tube **160**. The spring **200** acts against a flange **214** defined by the end portion **168** of the tube **160** and against the washer **198** to bias the exterior handle locking member **194** along the driver **182**. A cam support plate **216** is utilized to support the cam member **196** against the force of the spring **200**. The cam support plate **216** includes projections **218**. The projections **218** are received by longitudinal slots **220** of the exterior spindle **144** to couple the cam support plate **216** to the spindle **144** for co-rotation with the spindle **144**.

The exterior assembly **28** further includes an exterior lock actuator **222**. In the illustrated embodiment, the exterior lock actuator **222** is a lock cylinder configured to receive a key. The lock cylinder **222** is operable, via the key, to rotate the driver **182**.

It should be understood that the illustrated exterior handle **140** is just one possible construction of the exterior handle **140** and in other embodiments the exterior handle may take other suitable forms, such as conventional round knobs, levers, and the like.

In operation, referring to FIGS. **1** and **5**, when the button **82** of the interior locking actuator **80** is in the unlocked position, as illustrated in FIGS. **1**, **5**, and **7**, a user can manually rotate either the interior handle **52** or the exterior handle **140** to retract the latch **30** in order to open the door. Referring to FIGS. **1** and **2**, rotation of the exterior handle **140** rotates the exterior spindle **144**, which rotates the exterior latch refractor **164**, thereby rotating the tube **160**. Rotation of the tube **160**, which is engaged with the latch actuator **32**, retracts the latch **30**. When the latch **30** is retracted, the user is able to open the door. Referring to FIG. **4**, similarly, rotation of the interior handle **52** rotates the interior spindle **66**, which rotates the interior latch retractor **126**, thereby rotating the tube **160** (FIG. **2**) to retract the latch **30**.

The user can lock the lock assembly **20** from the interior assembly **26** by using the interior locking actuator **80**. When the lock assembly **20** is locked, the exterior handle **140** is inoperable to retract the latch **30**. FIGS. **5** and **7** illustrate the interior locking actuator **80** in the unlocked position. FIGS. **6** and **8** illustrate the interior locking actuator **80** in the locked position. To lock the lock assembly **20**, the locking actuator **80** is both pushed and rotated to move the locking actuator **80** from the unlocked position to the locked position. Pushing the button **82** moves the button **82** and the body **84** with respect to the spindle **66** in the direction of arrow **224** of FIG. **6**. Also, the user manually rotates the locking actuator **80** with respect to the spindle **66** in the direction of arrow **226** of FIG. **6**. Therefore, to move the locking actuator **80** from the unlocked position (FIGS. **5** and **7**) to the locked position (FIGS. **6** and **8**), the user both pushes the button **82** and rotates the button **82** with respect to the spindle **66** and the interior handle **52**.

Referring to FIGS. **6** and **8**, when the locking actuator **80** reaches the locked position, the tab **92** of the retaining member **90** is aligned with the retaining member aperture **96** of the interior spindle **66** and the spring **94** forces the tab **92** to extend into the retaining member aperture **96**. In the position illustrated in FIGS. **6** and **8**, the retaining member **90** retains the locking actuator **80** in the locked position against the rotational bias in the direction of the arrow **116** (FIG. **5**) about the axis **110** caused by the spring **102** and against the bias along the axis **110** in the direction of arrow **118** (FIG. **5**) caused by the spring **104**.

Referring to FIG. **2**, when the locking actuator **80** is in the unlocked position, the driver **182** is also in an unlocked position because the locking actuator **80** and the driver **182** are coupled for co-rotation via aperture **190** (FIG. **4**) and the driver **182** rotates between the unlocked position (FIG. **7**) and the locked position (FIG. **8**) with the interior locking actuator **80**. When the locking actuator **80** is moved to the locked position, the driver **182** is rotated to the locked position (FIG. **8**). When the driver **182** rotates from the unlocked position (FIG. **7**) to the locked position (FIG. **8**) the cam **196** (FIG. **2**) also rotates with the driver **182**. Referring to FIG. **2**, such rotation of the cam **196** causes the locking member **194** to move along the driver **182** in the direction of arrow **228** of FIG. **2** because of the position of the ramps **210** and the spring **200** acting against the locking member **194**, which pushes the locking member **194** in the direction of arrow **228**. Therefore, the locking member **194** moves out of the slots **170** of the tube **160** and into the slots **232** (FIG. **3**) of the exterior chassis **142**.

Referring to FIGS. **2** and **3**, in the locked position, the exterior handle locking member **194** extends through the elongated slot **220** of the exterior spindle **144** and the exterior handle locking member **194** is received within slots **232** of the

exterior chassis **142**. Therefore, when the locking member **192** is in the locked position, the exterior spindle **144** is coupled to the exterior chassis **142** using the locking member **194** such that the exterior spindle **144** generally cannot rotate with respect to the exterior chassis **142**. The exterior handle **140** is coupled for rotation with the exterior spindle **144**, and therefore, when the exterior handle locking member **194** is in the locked position, the exterior handle **140** cannot rotate with respect to the chassis **142** to retract the latch **30** (FIG. **1**).

Referring to FIG. **2**, the driver **182** can also be rotated between the locked and unlocked positions using a key that is received within the lock cylinder **222**. The key can be rotated to rotate the driver **182**. Rotation of the driver **182** from the locked position (FIG. **8**) toward the unlocked position (FIG. **7**) also rotates the interior locking actuator **80** because the driver **182** is received in the aperture **190** (FIG. **4**) of the locking actuator **80**. Rotation of the locking actuator **80** causes rotation of the retaining member **90**, and therefore, rotation of the driver **182** from the locked position toward the unlocked position causes the retaining member **90** to rotate relative to the spindle **66**. Such rotation cause ramps **236** (FIG. **4**) of the tab **92** to cam against the spindle **66**, which causes the tab **92** to move against the bias of spring **94** and out of the aperture **96** of the spindle **66**. With the tab **92** no longer engaged in the aperture **96** of the spindle **66**, the torsion spring **102** rotates the locking actuator **80** in the direction of arrow **116** of FIG. **5** toward the unlocked position while the spring **104** moves the locking actuator **80** in the direction of arrow **118** along the axis **110** toward the unlocked position (FIG. **5**).

Rotation of the driver **182** from the locked position (FIG. **8**) to the unlocked position (FIG. **7**) rotates the cam **196** (FIG. **2**), which causes the ramps **210** to move with respect to the ears **204** of the locking member **194**. Such movement of the rams **210** forces the locking member **194** to move along the driver **182** against the bias of the spring **200** and out of the slots **232** (FIG. **3**) of the chassis **142** and into the slots **170** of the tube **160**. With the ears **204** no longer in the slots **232** of the chassis **142**, the user is free to rotate the exterior handle **140** to retract the latch **30**.

Referring to FIGS. **1** and **8**, the lock assembly **20** can also be unlocked by rotating the interior handle **52**. As discussed above, rotation of the interior handle **52** to rotates the interior spindle **66**. When the interior locking actuator **80** is in the locked position (FIG. **8**), rotation of the interior handle **52** rotates the interior spindle **66** which causes the interior spindle **66** to cam against the ramps **236** of the retaining member tab **92**. Continued rotation of the spindle **66** via the handle **52** forces the tab **92** to move out of the aperture **96** in the spindle **66** against the bias of the spring **94**. As discussed above, with the retaining member **90** no longer interconnecting the locking actuator **80** and the interior spindle **66** (FIG. **7**), the spring **102** rotates the locking actuator **80** in the direction of arrow **116** of FIG. **5** about the axis **110** while the spring **104** moves the locking actuator **80** along the axis **110** in the direction of arrow **118** of FIG. **5** to both push and rotate the locking actuator **80** to the unlocked position. Continued rotation of the interior handle **52** retracts the latch **30** to allow the user to exit the door. Therefore, the user can open the door by rotating the interior handle **52** when the lock assembly **20** is locked (i.e., 'emergency egress') and the lock assembly **20** becomes unlocked when the user rotates the interior handle **52** to retract the latch **30**, thereby providing a non-lockout feature. Also, the lock assembly **20** includes the interior locking actuator **80** that is both pushed and turned to move between the locked and the unlocked positions, which has been found to provide a relatively secure and reliable mechanism for locking and unlocking the assembly **20**.

FIG. **9** illustrates an exterior assembly **28'** for use with the interior assembly **26** and the latch assembly **24** discussed above with respect to FIGS. **1-8** according to another embodiment of the invention. The exterior assembly **28'** can be used in place of the exterior assembly **28** discussed above. The exterior assembly **28'** is similar to the exterior assembly **28** discussed above with regard to FIGS. **1-8** and therefore like components have been given like reference numbers with the addition of a prime symbol and only differences between the exterior assembly **28'** and the exterior assembly **28** will be discussed in detail. The exterior assembly **28'** includes an exterior lock actuator **222'** that includes a base **240'** and a cover **242'**. The base **240'** and the cover **242'** are coupled to the driver **182'** for rotation with the driver **182'**. The cover **242'** includes a slot **244'**. In operation, the user can insert a coin, screwdriver, or the like into the slot **244'** to rotate the driver **182'** to unlock the exterior assembly **28'**. Therefore, the exterior assembly **28'** is a privacy type lock assembly that does not include a lock cylinder and key arrangement like the lock cylinder **222** of the exterior assembly **28** of the door lock assembly **20** of FIG. **1-8**. The interior assembly **26**, discussed above with regard to FIGS. **1-8**, can be used with either a privacy type lock (FIG. **9**) or an entrance type lock (i.e., lock cylinder and key—FIGS. **1-8**).

Various features and advantages of the invention are set forth in the following claims.

The invention claimed is:

1. A lock assembly for use with a latch movable from an extended position to a retracted position, the lock assembly comprising:

an interior handle manually operable to move the latch from the extended position to the retracted position;

an interior locking actuator located on an exterior of the interior handle, the interior locking actuator manually movable from an unlocked position to a locked position;

a biasing member that biases the interior locking actuator toward the unlocked position;

a retaining member that retains the interior locking actuator in the locked position against the bias of the biasing member;

an exterior handle;

a driver rotatable from a locked position to an unlocked position such that the exterior handle is manually operable to retract the latch when the driver is in the unlocked position and the exterior handle is inoperable to retract the latch when the driver is in the locked position; and

an interior spindle rotatable with the interior handle to move the latch from the extended position to the retracted position,

wherein the interior locking actuator is manually pushed and manually rotated to move the locking actuator from the unlocked position to the locked position,

wherein when the interior locking actuator is in the locked position, movement of the interior handle to retract the latch causes the biasing member to move the interior locking actuator toward the unlocked position,

wherein the retaining member engages the interior locking actuator and the interior spindle to retain the interior locking actuator in the locked position,

wherein rotation of the interior handle disengages the retaining member from the interior locking actuator and the interior spindle to allow the biasing member to move the interior locking actuator toward the unlocked position,

wherein the interior spindle is generally cylindrical, and

wherein the retaining member is at least partially located within the interior spindle.

2. The lock assembly of claim 1, wherein the interior locking actuator is pushed in a direction from the interior handle toward the exterior handle to move the interior locking actuator from the unlocked position toward the locked position and the interior locking actuator is manually rotated relative to the interior handle to move the interior locking actuator from the unlocked position toward the locked position and rotate the driver from the unlocked position to the locked position.

3. The lock assembly of claim 2, wherein the retaining member is coupled to the interior locking actuator for movement with the interior locking actuator in the direction from the interior handle toward the exterior handle and for rotation with the interior locking actuator relative to the interior handle.

4. The lock assembly of claim 1, wherein the interior locking actuator is rotated approximately 90 degrees relative to the interior handle to move the interior locking actuator between the locked and unlocked positions.

5. The lock assembly of claim 1, wherein the biasing member is a first biasing member that rotates the interior locking actuator relative to the interior handle from the locked position toward the unlocked position, the lock assembly further comprising a second biasing member that pushes the interior locking actuator in a direction from the exterior handle toward the interior handle to move the interior locking actuator from the locked position toward the unlocked position.

6. The lock assembly of claim 5, wherein the first biasing member includes a torsion spring, and wherein the second biasing member includes a coil spring.

7. The lock assembly of claim 5, wherein the first biasing member and the second biasing member are located within the interior spindle.

8. The lock assembly of claim 1, wherein the biasing member is located within the interior spindle.

9. The lock assembly of claim 1, further comprising a lock cylinder configured to receive a key, wherein the driver is coupled to the lock cylinder such that rotation of the key rotates the driver from the locked position toward the unlocked position.

10. The lock assembly of claim 1, further comprising a chassis and a locking member that interconnects the exterior handle and the chassis when the driver is in the locked position such that the exterior handle is inoperable to retract the latch when the driver is in the locked position.

11. The lock assembly of claim 10, further comprising a cam member coupled for rotation with the driver, and wherein the cam member moves the locking member along the driver into and out of engagement with the chassis.

12. A lock assembly for use with a latch movable from an extended position to a retracted position, the lock assembly comprising:

an interior handle manually operable to move the latch from the extended position to the retracted position;

an interior locking actuator located on an exterior of the interior handle, the interior locking actuator manually movable from an unlocked position to a locked position;

a biasing member that biases the interior locking actuator toward the unlocked position;

a retaining member that retains the interior locking actuator in the locked position against the bias of the biasing member;

an exterior handle;

a driver rotatable from a locked position to an unlocked position such that the exterior handle is manually operable to retract the latch when the driver is in the unlocked position and the exterior handle is inoperable to retract the latch when the driver is in the locked position; and

an interior spindle rotatable with the interior handle to move the latch from the extended position to the retracted position,

wherein the interior locking actuator is manually pushed and manually rotated to move the locking actuator from the unlocked position to the locked position,

wherein when the interior locking actuator is in the locked position, movement of the interior handle to retract the latch causes the biasing member to move the interior locking actuator toward the unlocked position,

wherein the retaining member engages the interior locking actuator and the interior spindle to retain the interior locking actuator in the locked position,

wherein rotation of the interior handle disengages the retaining member from the interior locking actuator and the interior spindle to allow the biasing member to move the interior locking actuator toward the unlocked position,

wherein the interior spindle includes an aperture, and

wherein the retaining member extends into the aperture of the interior spindle to retain the interior locking actuator in the locked position.

13. The lock assembly of claim 12, wherein the interior spindle contacts the retaining member and rotation of the interior spindle pushes the retaining member out of the aperture of the interior spindle to disengage the interior locking actuator and the interior spindle to allow the biasing member to move the interior locking actuator toward the unlocked position.

14. A lock assembly for use with a latch movable from an extended position to a retracted position, the lock assembly comprising:

an interior handle manually operable to move the latch from the extended position to the retracted position;

an interior locking actuator located on an exterior of the interior handle, the interior locking actuator manually movable from an unlocked position to a locked position;

a biasing member that biases the interior locking actuator toward the unlocked position;

a retaining member that retains the interior locking actuator in the locked position against the bias of the biasing member;

an exterior handle;

a driver rotatable from a locked position to an unlocked position such that the exterior handle is manually operable to retract the latch when the driver is in the unlocked position and the exterior handle is inoperable to retract the latch when the driver is in the locked position; and

an interior spindle rotatable with the interior handle to move the latch from the extended position to the retracted position,

wherein the interior locking actuator is manually pushed and manually rotated to move the locking actuator from the unlocked position to the locked position,

wherein when the interior locking actuator is in the locked position, movement of the interior handle to retract the latch causes the biasing member to move the interior locking actuator toward the unlocked position,

wherein the retaining member engages the interior locking actuator and the interior spindle to retain the interior locking actuator in the locked position,

wherein rotation of the interior handle disengages the retaining member from the interior locking actuator and the interior spindle to allow the biasing member to move the interior locking actuator toward the unlocked position, and

wherein the retaining member includes a tab and a biasing member that biases the tab into engagement with the interior spindle to retain the interior locking actuator in the locked position.

15. A lock assembly for use with a latch movable from an extended position to a retracted position, the lock assembly comprising:

a driver rotatable from a locked position to an unlocked position;

an exterior handle manually operable to move the latch from the extended position to the retracted position when the driver is in the unlocked position and inoperable to move the latch when the driver is in the locked position;

an exterior locking actuator coupled to the driver, the exterior locking actuator operable to rotate the driver from the locked position toward the unlocked position;

an interior handle manually operable to move the latch from the extended position to the retracted position;

an interior locking actuator coupled for rotation with the driver and the interior locking actuator manually movable from an unlocked position to a locked position and operable to rotate the driver from the unlocked position to the locked position;

a first biasing member that biases the interior locking actuator in a direction from the exterior handle toward the interior handle;

a second biasing member that rotationally biases the interior locking actuator with respect to the interior handle toward the unlocked position; and

a retaining member that retains the interior locking actuator in the locked position against the bias of the first biasing member and the bias of the second biasing member,

wherein rotation of the driver from the locked position to the unlocked position by the exterior locking actuator disengages the retaining member such that the first biasing member moves the interior locking actuator in the direction from the exterior handle toward the interior handle and the second biasing member rotates the interior locking actuator to push and rotate the interior locking actuator from the locked position toward the unlocked position,

wherein the first biasing member includes a spring, and

wherein the second biasing member includes a spring.

16. The lock assembly of claim **15**, wherein rotation of the interior handle disengages the retaining member to allow the first and second biasing members to move the interior locking actuator toward the unlocked position thereby rotating the driver toward the unlocked position.

17. The lock assembly of claim **16**, further comprising an interior spindle rotatable with the interior handle to move the latch from the extended position to the retracted position, wherein the retaining member engages the interior locking actuator and the interior spindle to retain the interior locking actuator in the locked position, and wherein rotation of the interior handle disengages the retaining member from the interior locking actuator and the interior spindle to allow the first and second biasing members to move the interior locking actuator toward the unlocked position.

18. The lock assembly of claim **17**, wherein the interior spindle is generally cylindrical, and wherein the first and the second biasing members are located within the interior spindle.

19. The lock assembly of claim **16**, wherein the interior locking actuator is manually pushed in a direction from the interior handle toward the exterior handle to move the interior locking actuator from the unlocked position toward the locked position and the interior locking actuator is manually rotated relative to the interior handle to move the interior locking actuator from the unlocked position toward the locked position and rotate the driver from the unlocked position to the locked position.

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